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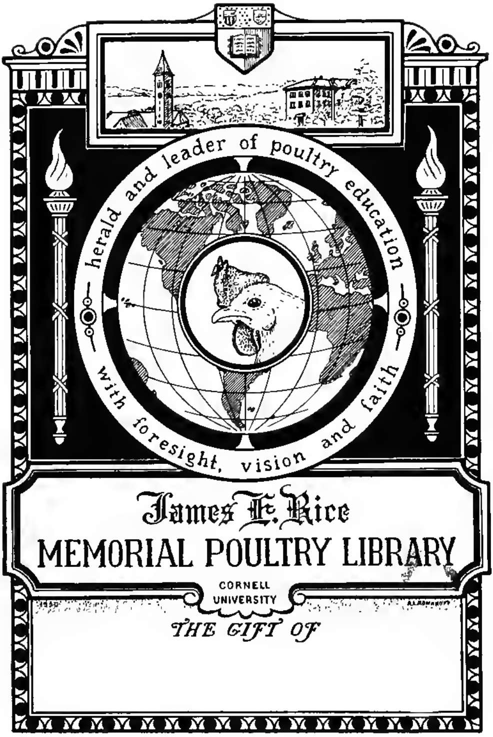
herald and leader of poultry education
with foresight, vision and faith

James E. Rice
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The housing and feeding of stock.

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THE
HOUSING AND FEEDING
OF STOCK.

SECTION IV.

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SURPRISE has been expressed by some readers of our handbooks on poultry keeping, that we did not commence at the beginning, and show how to properly accommodate, feed, and manage the stock birds previous to branching off into other matters, such as rearing, poultry farming, and fattening fowls. We therefore think that a short explanation of the reason that induced us to follow the course we have, may not be out of place here. Arrangements were made in the spring of the year, that we should start writing a series of small books on the many different phases of poultry keeping, and that these, before appearing in book form, should be published in *The Feathered World;* and the question naturally arose, what subject would be likely at the time to be of most service, and be most acceptable, to the readers of this paper? and the "rearing and feeding of chickens" was considered most likely to fulfil these requirements. We therefore crave the reader's kind indulgence for having attempted to run before walking.

VENTILATION.

It matters not what description of house is employed for the accommodation of poultry, the one great thing necessary is to ensure a fresh and continual supply of pure air, without subjecting the birds to the liability of taking cold by being placed in a direct draught. We could, did we consider it necessary, give an elaborate plan for carrying out this matter of ventilation to perfection; but, having proved that very simple arrangements answer the purpose admirably, we will merely content ourselves by describing the precautions that we personally take in our own fowl houses to ensure the health of the inmates. It will be apparent to anyone who has considered this subject that the two chief portions of the fowl's body that should be protected from draught during the long, cold winter's nights are the underneath portion and the stern. If the cold wind blows straight at the bird's breast, or even at the side, the feathers prevent it from penetrating to the body, and thereby doing mischief. But let the wind blow from underneath the body, or towards the tail of the bird, then the feathers are lifted up, the body is partially uncovered, and the cold has comparatively a free hand to play sad havoc to the bird's system. To prevent this occurring, in the first place, let the perches be arranged only round the sides of any house, and not, as is sometimes done, in the middle.

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Then place a manure board (recommended by Mr. Lewis Wright in his first edition of "Practical Poultry Keeping"), such as we will more fully explain presently, directly under and about 15 in. below the perch. This board should be wide enough to be placed flush up against the side of the building, and to extend about one foot beyond the perch. By this means draught from the back or underneath the bird is prevented. It does happen at times that a bird will take it into its head to roost with its tail pointed towards the opposite side of the house, instead of, as we would wish, its head; but by shifting the bird round for a few nights, this habit can easily be cured. When this method of protecting the fowls is employed, we have always found that the ordinary hole by which the birds obtain an entrance to and from the house answers all purposes as far as the admittance of fresh air is concerned. The next important consideration is the outlet for the impure atmosphere. Foul gases always ascend, therefore let a ventilator be placed at the highest portion of the roof, and at the other end of the house to that in which the entrance hole for the fowls is made. About the best form of ventilator possible is that invented by Captain Terry and patented by the late Mr. Comyns.

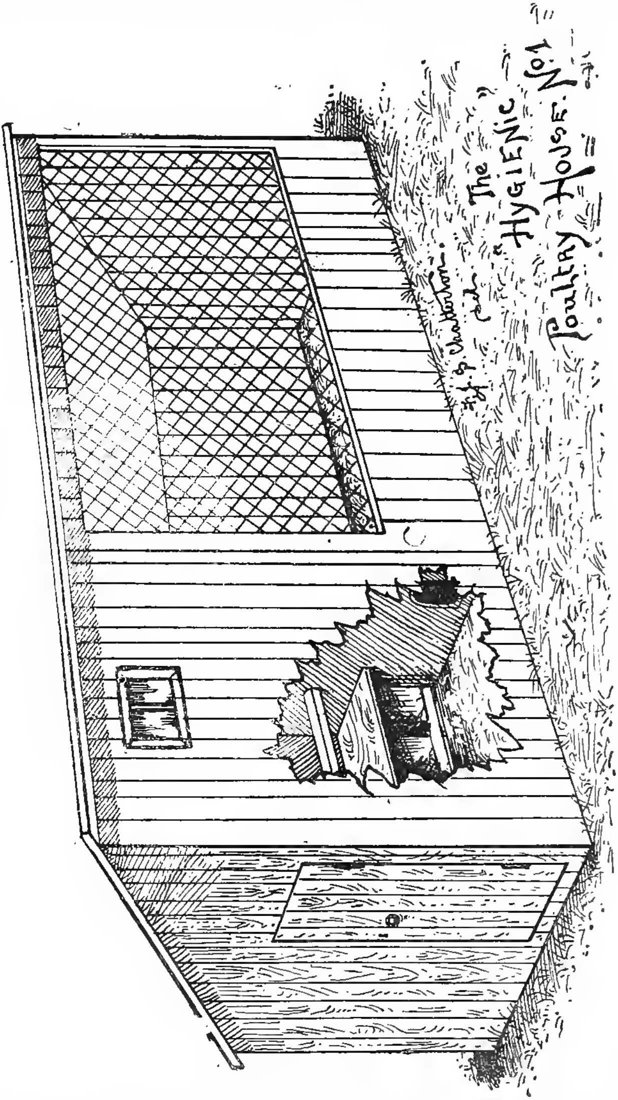
This consists of a hollow tube, with holes perforated on the under side, through which the foul air passes into the outside world from the ends which protrude on either side of the building. In the centre of this tube is a division, so that if the wind is blowing directly on to one side of the house, and thereby preventing gases from easily escaping, the other half of the ventilator is not interfered with. This, of course, is applicable to a gable roofed house only.

The Size and Shape of House.

The exact size of any fowl house will naturally depend upon the number of birds it is desired to place together. We, however, strongly advise that no house should be built for the purpose of containing *more* than twenty-five. We will presently explain the system we adopt in calculating the dimensions of a house necessary for any given number of fowls. But previous to doing so, let us consider what shape of house is most desirable. Having kept fowls in houses of all manner of shapes and sizes, we long since came to the conclusion that there was nothing to equal a long narrow house, and principally for this reason, that if you desire to overhaul your birds in the day time, you can in a narrow house quickly catch them; but that in a more or less squarely built house this is often a by no means easy feat to accomplish. Our advice is, let the house be narrow (4 ft. 6 in.), and let the length of it be determined in the following way. Calculate that two perches will only be employed, one running the length of the house and one across it, and allow 9 in. perch room for every fowl you desire to accommodate in it. Thus a house measuring 6 ft. by 4½ ft. represents a total perch room of 126 in.; 9's into 126 are 14, *i.e.*, the above sized house will comfortably accommodate fourteen fowls of fair average size. As regards height, 7 ft. at ridges and 5 ft. at eaves are serviceable measurements, without using more materials than necessary.

Covered Run Underneath.

The advantage of having a covered run underneath the house is (so the advocates of this principle say) that space is thereby saved, and the fowls have a comfortable place that they resort to in wet or windy weather. Granted; but let us look at the *dis*advantages that arise from the adoption of such a system. You are desirous of catching a few fowls in the day time that are in a pen where such a house is provided for them. All goes well until you have by accident driven the birds near to the house, when under the house they go like a shot, and the height of this underneath run being of necessity very low (generally about 2 feet), down you have to go on your hands and knees to try and catch the fowls that have collected at the furthest corner, and just at the very moment when you think you have got them, out they bolt on the other side of you, and being in such a cramped position you are some time in extricating yourself from the numerous unpleasant insects which (owing to the inaccessibility of the place, it is repeatedly skipped when cleaning operations are in force) have bred and thrived in the dust and filth that have been allowed to accumulate, and then only to find that the birds are in exactly the same place as they were before you started to catch them, and that the whole undertaking has to be gone through again, but this time with still greater caution, as the fowls are


The HYGIENIC Poultry House No 1
F. G. Chatterton. del.

considerably scared by your former ineffectual efforts. But another, and really more important, point to consider in connection with suchlike constructed houses, is this:—The roof of the covered run, which is also the floor of the house proper, becomes in time, unless a great deal of unnecessary labour is bestowed upon it, saturated with the droppings of the birds, which are trodden into the cracks and crevices of the boards, so much so that when opening the door of these houses in the morning, after they have been used for any length of time, a faint, sickly smell arises to your nostrils, and birds cannot thrive properly in an impure atmosphere. If it is necessary to provide a covered run, and it is always advisable to do so, unless the fowls have access to other buildings of some sort, let it be built in extension of the house proper, and not underneath it.

THE FLOOR OF THE HOUSE.

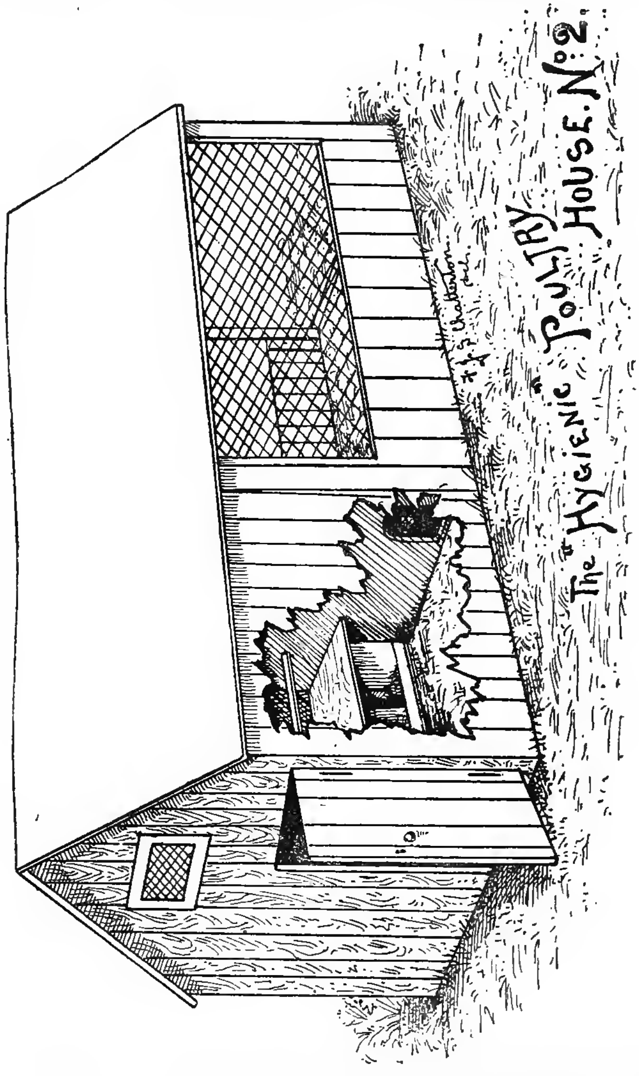
A concrete or cemented floor has been, and is not infrequently, recommended as the most desirable material for making the floor of the house. Personally, we have two great objections to the use of such. In the first place, a cemented floor is very cold in winter time, and in order to guard against this evil a plentiful supply of peat moss litter, or dry earth, should be placed on top. But by so doing the value of the manure is greatly lost—that is to say, as a marketable commodity—and secondly, that the birds are liable to injure themselves by jumping off their perches in the morning on to such a hard and unyielding substance as concrete. For even allowing that ample litter of some sort is put on as a covering, birds will scratch about in it, and unless a good deal of labour is expended in covering up the bare places formed by such manœuvres, the injury above mentioned is still likely to take place. For it is a peculiar fact that fowls will, in nine cases out of ten, aim to drop upon the bare floor in preference to alighting on the soft materials provided. Our own experience is that nothing equals the earth itself, well beaten down and made as smooth as possible. Then, should any of the droppings of the fowls be found on the ground, they can easily be scraped up when cleaning the manure boards presently mentioned ; or if the manure is intended for home use only, then a good layer of road dust or dry loose earth or sand may form the top dressing, this latter being bodily removed, before it becomes foul, and replaced with fresh. The run we advise being treated in like manner, if it is roofed over, so as to prevent the loose materials from becoming wet. But if no protection is afforded from the weather, by all means keep the floor or the run as bare as possible, and frequently scrape up any manure that may be deposited round about.

THE MANURE BOARDS.

More than twenty years ago we saw a description of these given in Mr. Lewis Wright's first book on poultry keeping, viz., "Practical Poultry Keeping," and ever since we have always constructed our fowl houses on this principle, and are fully convinced that no other form, at present advanced, of keeping the house sweet and clean answers the purpose half so well. Obtain three 9 in. floor boards the length of the perches, and fix them together by nailing cross battens on the underneath side. On the sides of the house, at each end of the perches, nail a piece of quartering 2 ft. 3 in. long, the upper side of which is 16 in. below the perch. Then place your manure board on the top of these supports. A little ingenuity is required to make a neat job of the cross perch and the manure board for the same, but there is no real difficulty. These boards should be lightly sprinkled over with dry earth or sand, and once a week (oftener is not absolutely necessary) the attendant should take a pail and a short handled hoe. With the latter he can in half a minute scrape all the droppings into the pail, collect any that may be on the floor — which, if a covered run is provided, will not be much — and resprinkle the boards with sand. The amount of labour saved by this very simple contrivance is enormous, and to thoroughly appreciate this method, you require to have—like ourselves —actually performed the work of cleaning out a number of houses at one time where this and other forms of construction are used. Anything that will save labour should *never be neglected* on a poultry farm, whether it be merely a back yard, or one containing hundreds of acres, for this very simple reason—we never knew the time when it could be truthfully said that there was nothing that was possible to do for the wellbeing or advantage of the stock, and if the owner's, or the poultryman's, time is taken up largely by manual labour (which by very little extra outlay might have been saved), it is impossible to give sufficient time in looking after the stock. We are induced to mention this matter of time saving because we know of numbers of poultry keepers who never consider this question at all—"make shift" is their motto. But it is a very bad one to take as an example.

The Perches.

In our chapters on "Chicken Rearing" we treated somewhat fully on this subject, and intend here to merely refer to the old birds' roosts, also leaving the question of Asiatics alone until we are dealing with the different breeds


The Hygienic Poultry House. No. 2
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minutely. For the general run of fowls we are inclined to prefer a 2½ in. perch, planed all over, and the upper side nicely rounded at the edges. This should be placed 15 in. from the wall (to prevent the cock bird from damaging his tail—further distance from the wall is sometimes necessary), and 2½ ft. from the ground. Let the ends fit into sockets nailed to the building, so that the perch may easily be removed for cleaning when necessary.

THE NEST BOXES.

The nest boxes should be about 14 inches square, and if the manure boards, as recommended, are used, they need have no bottoms, no tops, and no backs. Divisions held together by a 3 inch strip along the bottom of the fronts, and a 2 inch piece on the top, and corresponding pieces on the top and bottom of the back, answer admirably. The side of the house forms the back, the manure board the top, and the ground in any case is to be preferred to wood for the bottom. Such constructions are adaptable for laying hens only, and not for the brooders. These latter we will refer to when dealing with the sitting pen.

This sketch will give a very fair idea of the sort of house and fittings that we most approve of. The manure board is seen through the opening cut out by the artist in the building, above is the perch, and underneath the nest boxes. There are, however, several slight improvements to be made in the above. The door we would place in the front of the house, and at the corner near to the hole where the birds enter, then the second perch can come down the side where the door is at present. Ventilation should also be provided above the present door. The run, of course, requires a door either at end or front, whichever is most convenient, and a further outlet for the birds to come outside when thought advisable.

The next illustration shows practically the same style of house, but built with a gable roof, instead of a lean-to one. The same alterations it would be advisable to make as those recommended in the previous house—viz., to remove the present door to the side adjoining the run, and so allow the end of the house to have a second perch across it. The run in this sketch is left in an unfinished state. The end can, however, either be fitted up the same as the sides with 2 ft. 6 in. boarding, and the rest with wire netting, or can be completely boarded up altogether. A very serviceable run for birds affected by the cold—as, for instance, Minorcas—is made by half boarding up the sides and having hinged shutters to fasten up over the wire work, and by boarding up the end and inserting a large window, in order that when the fowls are shut up, they may have plenty of light.

ADVANTAGES OF A COVERED RUN.

When fowls have their liberty, and are able to get into cart or cow sheds, or such like buildings, most poultry keepers never bother about erecting a covered run, for they argue, not without reason, that if the birds desire to get out of the cold and rain, they can easily do so. The drawback to this arrangement is, that the fowls often will not do so when they ought. It is all very well for some people to say that the birds seem to enjoy themselves at times out in the open, even when it is cold and rainy, and that they ought to know best what is good for them. But where would other domesticated stock soon be if they were allowed to deport themselves exactly as they wished? We consider that many of the present day poultry diseases are caused by the birds coming out of their warm houses in the morning during the bad winter weather and getting a thorough chill. When capital is of no consideration, we strongly advise that good sized covered runs—large enough to comfortably accommodate the number of birds in any given house—should always be provided, and that during wet weather the fowls should never be allowed out. Let it not be supposed that we advocate the birds being confined under any circumstances if the weather is unfavourable, because we do not. To shut up the fowls in a little run, which, perhaps, is covered with an inch or two of wet mud, is likely to do infinitely more harm than allowing the birds to take their chances outside. When the principle of confining poultry is acted on, every care should be taken that their quarters are as roomy and as comfortable as it is possible to make them. Those who have never tried confining poultry in well protected covered runs in winter would be astonished at the great increase this fact alone makes in the number of eggs produced. There are few things, however, that, possessing great advantages, do not also contain a certain proportion of *dis*advantages. Confining poultry means that a greater amount of labour has to be expended in cleaning out the house and run, for as the birds are confined to the same the whole of their time, naturally the droppings deposited are far more numerous, and it being a matter of the utmost importance that confined fowls should be kept scrupulously clean, the necessity of repeated operations in this direction is apparent.

FOOD VESSELS.

Provided the ground on which the fowls' food is usually thrown down is hard and clean, or that there is ample space on grass, etc., to continually change the exact spot, feeding vessels are not necessary, though they are often the means of saving a not inconsiderable amount of waste when used. But in the event of the birds always having to be fed on the same piece of ground, especially if it cannot be kept scrupulously clean, we strongly recommend the employment of some vessel or vessels from which the fowls may partake of their daily meals. To anyone who has studied this question our reason for advocating the system is self-evident. Few things are more injurious to the well being of poultry than being compelled to swallow their own excrements; much more so is this the case if such excrements are not in a healthy condition. But when food is thrown down on unclean ground, it is impossible for the birds not to consume a portion during the scramble which takes place to swallow as quickly as possible the good things provided for them. Therefore, under such circumstances, always provide some kind of vessel from which the fowls may feed. Personally, we have found a long wooden trough—like a rabbits' trough—answer admirably. There is another advantage in the adoption of a feeding vessel, especially to amateurs who are not quite sure how much they ought to give their birds, for as soon as it is seen that some of the birds are beginning to stop feeding, the remainder of food left in the trough can be emptied back into the pail, and by so doing, not only will a certain amount of waste be prevented, but the fowls themselves will be considerable gainers. Their organs will not become unduly fatted, but remain in healthy, good working order, and the egg basket will become heavier in consequence. As soon as the feeding is finished hang the trough up on the side of the house by a piece of string until required next time. By so doing it does not, as it would otherwise be liable to, become fouled by the birds treading upon it.

WATER VESSELS.

Pure, fresh water is a desideratum in poultry keeping, yet what a number of poultry keepers fail in paying proper attention to this matter. Numbers every year start fair with brand new fountains on the self filling principle, and all goes well for a time. But in most vessels made on this system it is utterly impossible to get the hand in to properly clean them out, and consequently in a short while they become coated with a slimy greenish matter most injurious to the health of the stock. Others purchase open zinc vessels, and these in many ways are infinitely preferable to self-filling ones, but they sometimes forget that acids put into them are liable to formulate a poison, and so by at times adding chemicals to the water, in order to benefit their birds, they occasionally have to bemoan a sudden and mysterious death. An open round vessel made of iron and enamelled inside, is the best form of drinking vessel we have ever used. It is no trouble to clean, the quantity of water remaining can be seen at a glance, and any chemicals may be added with impunity.

SPECIAL ACCOMMODATION FOR LAYERS.

We mention in our chapters on "Poultry Farming" the advisability, where fowls are kept solely for laying purposes, of keeping them warm in winter time, and we enumerated certain experiments that we had proved to be highly successful. Since then we have been informed by a gentleman that for two years he has followed a somewhat similar method to that which we advocate with the best possible results. His plan was as follows: At the back of a greenhouse, measuring some 60 ft. in length, he erected his poultry house and run. The height of the house and run at the back, which abutted on to the wall of the greenhouse, was 7 ft. 6 in., sloping towards the front to 6 ft., the house and run being 5 ft. wide. At the end of the run, up to 2 ft. 6 in., the floor was boarded, and the whole of the remainder of the end entirely glass. The front of the run was boarded up 2 ft. 6 in. high, and the rest wire netting, but from the top of the boarded portion were hinged wooden shutters of the same width, viz., 2 ft. 6 in. These, when not required, simply hung down in front, but in cold or windy weather were closed up, and thus only 1 ft. of open netting was left at the top of the run by which the cold air could enter. Two holes were punctured in the wall of the greenhouse underneath the manure board, and four holes in different parts of the wall in the covered run. In these holes 4 in. pipes were inserted, projecting a few inches at each end. The warm air from the greenhouse was thus conducted to the fowlhouse, and when this was not required plugs were inserted into both ends of the pipes, which had the desired effect. We have not tried exactly such a system ourselves, but from the knowledge we have gained by such experiments as we have made in this direction we feel convinced that the theory is sound, and, further, we have no cause to doubt the truthfulness of our informant's statements. Undoubtedly, if birds are kept in warm—not heated—congenial atmosphere, both in the house *and* runs, during cold weather, the number of eggs they lay will greatly surpass the amount obtainable from their own sisters of the same strain which are not so provided for. That it would pay to build heating apparatus for the express purpose of warming the fowls' houses and runs we have strong doubt, but we think the suggestion of utilising the heat required for some other purpose worthy the attention of those poultry keepers who are able to apply the idea; and we see no strong objection to applying the same process to exhibition pens, from which very early eggs are required for sitting, and to some—those who possess tip-top specimens of any variety for breeding from—the expense of erecting such houses and runs, together with heating apparatus, would be amply repaid by being enabled to put down a far greater percentage of eggs in December than had heretofore been possible. We have thought that a considerable improvement might be made in the system, as given above, of utilising the heat from a greenhouse. If two holes were made in the wall at the end of the house, and two more at the end of the run, branch pipes might be attached to each of the pipes in the greenhouse so that water could, when required, flow through the fowls' department also, and be shut off by means of a stop-cock when necessary. In fact, when we think of the matter, there are a number of ways and means by which heat, necessary for other pursuits, could be conducted to the poultry house with advantage to the fowls, and profit to their owner; and the reader will, in most cases, be in the best position to formulate the means most adaptable to his own special circumstances, always remembering that if heat is applied to the roosting abode, so also must the atmosphere in which the birds are placed in the day time be warmed, and that to do the one without the other is to court failure with a vengeance.

A FEW REMARKS ON FEEDING.

It is universally acknowledged amongst all poultry-keepers who have in any way studied this question, that soft food should be given the birds in the morning, and hard corn at night, and the reason for so doing is equally well understood; but there are a number of persons who keep poultry—some having done so all their lives—who are still following on the same lines as have been handed down to them for the last ten generations, and who, if they give soft food at all, never think of doing so in the early morning, but wait until they have plenty of time in the afternoon. To such as these it will be as well to explain why the soft food should be given in the morning, and not at night time. When a fowl has filled, or partially filled, its crop, it passes the food on to the gizzard, and here it is ground up fine into a somewhat similar condition as that which takes place when our own food is ground up by the action of our teeth. But although the gizzard is exceedingly tough and capable of grinding up very hard substances, such as nails, stones, etc., it differs from our own teeth, inasmuch as it cannot at once crack even the kernel of wheat, but requires time to gradually preform the process. It follows, therefore, that a fowl may have a crop full of corn, and yet it may be in a state of starvation from the want of food, as the action of the gizzard is not quick enough to at once pass the same into the system of the fowl. But supposing the food is already ground up, as in the case of meals, the bird will almost immediately be deriving benefit from the food it has consumed. During the night time the crop of a healthy fowl becomes completely empty, and in fact in the cold, long winter nights the whole of the food partaken of the day previous has been used up as fuel for the system, so that in the early morning it steps out into the bleak, cold winds with an empty stomach. If hard corn is now given it is some considerable time before the poor bird derives any benefit from its breakfast, but if meal is given instead it will be but a short time before the full advantage of having eaten its breakfast will be felt, and in consequence the formation of eggs—the one thing most wanted—will not be checked. For exactly similar reasons corn should always form the food given in the evening. During the long nights, especially, will the adoption of snch a system prove its value, for then will the bird be able to, for many hours, gradually add a little more fuel, and so keep up, as it were, the fire of life and warmth in its system, and defy the evils of the surrounding cold. Whereas, if soft food had been given, in the course of a few hours the whole would have been burnt out, and the bird left with nothing in its crop or gizzard to combat the elements.

TIMES TO FEED

Twice a day is quite sufficient to feed all stock birds, on either meals or corn. The meals should be given as early as possible in the morning and corn in the evening. Our own times for feeding stock birds are usually these:—In summer time, 6 a.m. and 5 p.m.; and in winter, 7 to 7.30 a.m. and 4 p.m. In the middle of the day green food of some sort should always be supplied; but we will deal more particularly with this under the heading of "Grass Runs."

BEST FOODS TO USE.

There is no book on poultry that we ever remember reading that does not mention the advisability of continual change in the foods given to the birds. Most works recommend the feeding of one variety of corn this week, and changing it to another sort next, and so on, because by so doing the fowls have plenty of change of food and (so their authors maintain) derive material benefit from being thus dieted. Our experience is otherwise, and we cannot agree with those writers who advocate this principle. Theoretically considered nothing is more feasible, but unfortunately theory and practice will not always combine. Take, for instance, the five different kinds of corn most usually recommended—viz., wheat, barley, dari, buckwheat, and oats. Few country corn dealers can be relied on to supply a good sample of each of these when required, and, in fact, as regards the two latter, hardly any country merchants ever possess a sample fit for poultry to consume, and so, unless in many cases the poultry keeper has a long purse and ample storage room to get in supplies for a rainy day, it naturally follows that he is often compelled to leave out several of the courses from his "bill of fare," or to feed on inferior grains. But the real objection to the plan is this: Fowls require to be fed on certain corn for some little time before they will devour it greedily, and if, just when you have got them accustomed to one class of food you change it to another and then another, and continue in like manner, they are some three or four days (sometimes longer) after each change before they will consume a sufficient amount of nourishment, and thus the benefit that they might have derived from a change of diet is more than neutralised. If you can ensure a regular supply, and each day allow your fowls a variety of foods from chickenhood upwards, no doubt the plan is good; but any birds that you buy in from other breeders who do not, and cannot, feed their fowls in like manner will undoubtedly, for a time, suffer when put on to your system of feeding.

We fully agree that a change of food is occasionally—we might even say frequently—desirable. But our method of giving the same differs materially from those who advocate that such a plan should be carried out by employing the corn for this purpose. All poultry keepers who take any interest in the welfare of their birds use meal for the morning feed, and when fowls are accustomed to partake of meal daily it does not matter much to them whether it is composed of barley meal and middlings or buckwheat meal and middlings—it all goes down, and evidently with a relish. No having to half starve the birds here, in order to get them on to a change of diet or stopping their growth, the formation of eggs or the casting of feathers. They are accustomed to the sight of meal, and they cannot detect whether it is buckwheat meal or barley meal, and what the eye doesn't see the heart doesn't grieve after.

An analysis of the different kinds of grains and meals might perhaps be of interest and of use to a score or so of our readers. But as there are innumerable numbers of such published, and as ours, unless we went to considerable expense, would only be a copy of the same, we have thought it advisable not to occupy space on this subject, more especially as we are convinced that the average poultry keeper—to use a vulgar expression—doesn't care a hang about the theoretical part of the business, but wants sound *practical* advice, and if our knowledge is not practical, we are perfectly certain it isn't theoretical.

Oats, given as corn, rarely answer. The husks are very tough, and the birds have great difficulty in grinding them up, and crop bound is certainly not an uncommon mishap, where whole oats form the staple food. The ordinary English oat, and the light Russian oat, are the two worst offenders in this respect. If oats are given at all, they should be the little, white New Zealand oats weighing from 46 to 48 lbs. per imperial bushel.

Buckwheat is strongly advocated by many, and we like it very well ourselves. There are, however, two kinds of this grain, the grey and the brown buckwheat, sometimes called the French and the English, though both can be, and are, grown in England. It is the former that should be used, as its skin is not nearly so tough or so thick as that of the brown.

It is impossible for us, however, to recommend either the one or the other of the above, as suitable grains to feed poultry on, because of the necessity to rear birds on these grains in order to get them to eat them in sufficient quantities, and the husks are, in our opinion, too tough to be given as food for chickens. A similar remark applies, though not to the same extent, to barley, and we infinitely prefer to give both oats, buckwheat, and barley in the form of meal. Thus this leaves us with only two out of the five grains mentioned, viz., wheat and dari, and as a staple food we consider them hard to beat. Two-thirds wheat and one-third dari form our main food for stock poultry in the shape of corn the whole year round, with a *little* maize in cold weather.

In Section III., "Fattening Fowls," we fully describe the class of ground oats suitable for feeding fowls on, and we have only to add here that oatmeal will not answer the same purpose—besides being much dearer—nearly so well, the difference being that in ground oats the husks are cut up into very fine pieces, and there is consequently no chance of crop binding, and that these husks are highly nutritious to poultry when given in a fit and proper state; but that in oatmeal the husks are entirely extracted. One-third each of ground oats, barleymeal, and middlings is the finest general food we have ever fed either stock birds or chickens on. As a change, once or twice a week buckwheat meal may be added in the place of the barley meal, and an occasional feed of biscuit meal be given instead of any other.

It will thus be readily seen that, besides the additions, we have utilised the five grains previously mentioned, but have given them in such a form as they will be readily taken by the birds, and in such condition as they will reap the most benefit from their use.

The Good and Evil of Grass Runs.

Poultry keepers have so persistently been told by those in authority that nothing is more conducive to the health and wellbeing of their birds than by providing them with a grass run, that thousands will tell you that a man who is able to give his fowls even a few square yards of grass to run on stands in an infinitely better position to rear either exhibition chickens or table poultry than one not so fortunately (?) placed.

Everyone, whether he or she is a private individual or a public personage, is entitled to their own opinion. Our opinion is that the average grass runs provided by poultry breeders for their stock birds are, instead of being unmixed blessings, hotbeds of evil. That such an assertion will receive considerable adverse criticisms from many we have little doubt, but, as we have previously remarked, many poultry keepers are apt to accept certain dogmas in the science of poultry breeding without question, and are often quite unprepared with any reasoned defence of same. To make our assertion somewhat clearer, we would say that taking a quarter of an acre as the amount of available ground, we would undertake to keep double the quantity of stock on the ground in perfect health and condition if no grass was permitted to grow, than would be possible for anyone to do if the same place was beautifully covered all over with grass. Further, that we would rear a far greater number of chickens on this quarter of an acre of bare ground, and make them into finer exhibition or table birds than would be the case if grass was growing. Grass runs are accountable for, in our opinion, ninety per cent. of poultry ailments. This being, we believe, a new departure entirely in the science of poultry keeping, it is of some importance that we should make ourselves properly understood. If you can allow your fowls to have a free range over a large extent of grass land, there is no doubt but that they will derive considerable benefit from so doing. If you have large grass runs for your breeding pens, say 25 yards by 12 yards, and you keep them as clean as possible, you will obtain fair results. But if you have only, say, 12 yards by 6 yards, and wish to in that space keep half a dozen birds to breed from, don't let it be on grass. The reason is this: Fowls eat grass greedily, and it is highly beneficial to them, provided always it is in a fresh and wholesome condition. But a small plot of grass quickly becomes polluted with the droppings of the birds, the fowls still devour it and innumerable diseases spring from the consumption of this unwholesome food. Did we desire—irrespective of the cost of labour and feeding involved in such circumstances — to breed exhibition chickens, we would prefer to select a spot where no grass grew, that was perfectly dry, and where the rain would soak away almost as quickly as it fell. We mention this more particularly that those dwellers in towns, who are unable, if they would, to provide grass plots for their birds, may not be discouraged by thinking they have no chance to rear chickens equal to Mr. So-and-so, who has abundance of grass land. If they have got sufficient room for the purpose, and will attend to their birds as presently mentioned, they have equally as good a chance—we feel almost inclined to say better—than Mr. So-and-so with his thousand acres of pastures. We are prepared to state—without fear of contradiction from any *practical* breeder—that it is far easier to keep a dozen fowls in perfect health in a small run without grass than it is when the same is laid down with grass.

Necessity of Green Food.

We look upon dieting poultry on green food quite as much a necessity as it is for our own health that we should consume a certain proportion of vegetables at our daily meals. Dandelions, lettuce, cabbage, etc., all make excellent greens for this purpose. Tied by the roots and hung a foot or so from the ground, the birds eat it greedily, and it is thus kept sweet and clean. Grass cut up into inch lengths and given in a feeding trough is also good, and in winter time swede turnips or mangold wurzel cut in half will quickly be cleaned out and nothing but the husk left.

Every midday the birds should be given a feed of green food of one sort or another, but none should be left to become partially decomposed. Every day clean out any that is left from the previous day, and in very hot weather we prefer taking any remains away when we go to feed in the afternoon. Fowls that have not been accustomed to eat turnips and mangolds will at first often refuse to have anything to do with them, and it is, therefore, advisable for a start just to chip a little of it out, so that they may the more easily find a spot to commence at.

One other point in reference to this matter of turnips and mangolds. Never allow them to get frosted, as they then quickly decompose as soon as they commence to thaw out, and diarrhœa amongst the birds will be general.

OVERFEEDING.

Out of the very great number of farms, fanciers' yards, cottagers' poultry pens, etc., that we have overhauled, rarely have we ever found that the birds were insufficiently fed. The opposite is, however, often the case. It is altogether a mistaken kindness to feed your poultry to repletion; we hardly like giving the practice such a harsh term as cruelty, because we know it is owing either to the ignorance of the feeder or from carelessness—perhaps we should say thoughtlessness—of the same individual; but, without a doubt, birds that are overfed suffer agonies, and many succumb to the tortures they have been put to, often by people who would infinitely sooner suffer themselves than cause the least pain to a bird or animal. Ignorance is more often than not the cause of cruelty, both with children and live stock of every description, and we would most respectfully suggest to that admirable institution, the Humane Society, that they would do incalculable good to the cause they have at heart, if they were to distribute small circulars to owners of horses, dogs, poultry, rabbits, etc., giving a short résumé of the proper methods to be employed for their comfort, not omitting progenitors of the human race.

But to return to the subject of overfeeding of poultry. An overfed cock bird will fertilise but few eggs, though he is not put to anything like the same amount of suffering as a hen is when similarly treated. Overfed hens lay few eggs, at least they may lay well for a time, but presently soft shelled eggs will appear, and eventually the bird either dies or ceases to lay altogether.

THE CAUSE OF SOFT SHELLED EGGS.

Over and over again have we seen it asserted, when someone has asked for advice because his fowls were laying shell-less eggs, that an insufficiency of lime, chalk, oyster shells, or such like materials that go to form the shell of an egg, were the cause of the complaint. It is possible that once in a way such might really be the case; anyhow, we are not disposed to contest the possibility that in some isolated case the birds could not obtain a sufficiency of the right materials. But this we do say, that notwithstanding the many years of experience that we have had in breeding poultry, we have never seen such a case ourselves. As a matter of fact, quite the opposite is usually found. Cases of fowls laying shell-less eggs generally appear in the yard of some enthusiast who provides every want that the birds could possibly require. His anxiety to give them everything he can think of is just the very cause of the evil he deplores—in other words, he has overfed.

THE EFFECTS OF OVERFEEDING.

When the yolk leaves the ovary it passes into the oviduct, the functions of the latter are to clothe it with what is usually termed the white of an egg, and as it passes onward the skins and finally the shell are added. Such, at least, is what takes place when the oviduct is in a healthy condition,. But if the birds are internally fatted—we might here add that fat always accumulates internally before it appears externally—the available space for the formation of eggs is lessened, the oviduct, too, in severe cases, instead of being able to envelop the yolk with its several coverings, is more or less coated with fat, and the yolk either passes out in the same condition as it left the ovary or minus the shell. The secreting glands of the oviduct cannot perform their functions, and if such a state is allowed to exist much longer the mouth of the oviduct becomes choked with fat, and the bird in straining to pass an egg causes rupture and dies, as is often the case, on the nest.

ONE OTHER CAUSE OF SHELL-LESS EGGS.

Not infrequently exceptionally good layers will pass soft shelled eggs, the reason being that the ovary is very active, and the yolks are deposited in the oviduct quicker than the latter is capable of collecting the proper materials. If a bird lays two eggs within eighteen hours (many often do this) one of which has no shell covering it, there is nothing to become alarmed about. It is when a bird is known to skip a day and then lays an imperfect egg, that it may, as a general rule, be taken that overfeeding is the cause.

INSUFFICIENCY OF FOOD.

Although we strongly deprecate the system of overfeeding poultry, we by no means advocate the birds being kept in a state of semi starvation. An egg is most highly nutritious, and it is impossible for such to be formed unless ample foods are given for its formation. It is the old story over again, of asking the Israelites to make bricks without straw. What we should aim at is the happy medium between the two extremes. We like to see the birds very eager for their food as soon as they perceive their attendant coming with the pail, and after they have eaten up all that has been given them, that they will still run (though not nearly so quickly as before) if a handful is thrown a little distance from them.

QUANTITY TO BE GIVEN AND HOW TO MIX SOFT FOOD.

It is impossible to state any fixed amount of food that should be given to each fowl, for not only will a Plymouth Rock eat, and require, double or treble what a Hamburgh would consume, but individual birds' appetites vary as much as those of human beings, and a hen, when she is in full lay, or just about to lay, requires far more than she does when her egg producing organs are at rest. Each individual poultry keeper must use his or her own discretion, and if they follow on the lines stated in the previous paragraph they will not go far wrong. We will now proceed to describe the best method of mixing soft food. Obtain a large zinc pan, such as is used for washing household crockery etc., and let it be of ample size for the amount of meal you desire to mix up at a time ; too large a pan is of little inconvenience, but one too small for the purpose not only takes a far longer time to properly prepare the meal, but is a constant annoyance each morning to the mixer. Let the different kinds of meal be well mixed together when still in a dry state, now pour on some water (always warm in winter time), stir with a small wooden stick in order to get the water to circulate amongst the meal, then with the hand *rub* the meal on the bottom of the pan, until every particle of dry meal has disappeared, adding, if necessary, more water as the operation proceeds. It is far better for an inexperienced person to only add a little water at a time, as, although it is very easy to pour on a little more liquid if not sufficiently moist, it is by no neans such an easy matter to make it drier by adding more meal if the whole has been mixed up too sloppy. Meal for poultry should be mixed up into such a consistency that when pressed into a lump it will *readily* cling together, but that when thrown upon the ground it will crumble in pieces, but not into dust. It is impossible to properly mix meal unless the hand is employed to do it with, and with a little practice it can not only be done infinitely better, but much quicker than when a stick or some other utensil is employed.

DUST BATH.

Unfortunately fowls are subject to a variety of insect pests, and unless proper means are provided whereby the birds are enabled to cleanse themselves of these troublesome creatures, poultry rarely thrive for any length of time. In Section I. we pointed out what, in our opinion, was the primary cause of nine tenths of the deaths that take place in chickenhood, viz., ticks, and we are strongly of the opinion that these, and other insects, are the chief cause of stock birds getting out of sorts and becoming attacked by one or other of the many diseases that poultry are heir to. Take fowls that have got the roup, for instance, and you will find in ninety nine out of every hundred cases that the said birds are covered with insects. The same with leg weakness, "going light," and many other complaints. The bird's system has been lowered by these pests, and, in consequence, readily lends itself to the first disease that comes along. It might, not unreasonably, be urged that the bird, having caught some disease, was unable to rid itself of the insects, and that this was the reason for their being found in such large quantities. We cannot, however, agree with this theory, because it will generally be found that although the bird is infested with insects at the *commencement* of some disease, as the course of the said disease runs on, and the bird's system is still further lowered, the insects forsake the body in large quantities, if not completely. This seems to us to point to the conclusion that the insects prefer to attack a healthy, well nourished body, in preference to fastening themselves on to one more or less used up by some wasting disease. In any case we are fully persuaded that the destruction of insect life on poultry is one of the chief objects that all poultry keepers should have in view. For this purpose a dust bath should always be provided and protected from the rain. Road dust we prefer to any other material. Let plenty of this be placed in some favourite resort of the birds, and a liberal supply of insect powder mixed with it. Boards let down into the ground with their edges just appearing an inch or so above the level, in the shape of a box, make a capital receptacle for same, or an ordinary large size box may be employed. But in this latter case we would still let the box into the ground, as fowls much prefer it when thus placed, and will more frequently use it than when they are compelled to fly up to get their bath. Perhaps it may be as well to explain somewhat how it is that the act of a fowl dusting itself is instrumental in destroying the insects. Of course, when insect powder is used, it is obvious, as the powder of itself kills them, but hens free themselves very considerably when they have nothing but dry earth or sand to dust in. In this case it is caused by the bird shaking into the roots of the feathers a considerable amount of dust, so that the whole body, more or less, is covered on the actual flesh itself with a layer of dust. The insects, those that are on the flesh, crawl out on to the top of the dust, the hen gives a vigorous shake of her body, and the whole—dust, insects, and all—are scattered right and left.

THE GOOD OF STIMULATING FOODS AND POWDERS.

In Section II., "Poultry Farming Up to Date," we have more fully explained the good results that are likely to accrue by high feeding, from the point of view of the egg producer, and we have not the slightest hesitation in asserting that with good accommodation, proper attention, and feeding the birds with a plentiful supply of meat, and a free sprinkling of the meal with one of the many powders now advertised for promoting the laying of eggs, that a given quantity of fowls can be induced to lay on an average from twenty to fifty eggs more than they otherwise would have done under ordinary circumstances, the great difference in the average number of eggs arising from the fact that some pure breeds and crosses are capable of being forced far more than others. A poor egg producing variety cannot by any possibility be made to lay as many eggs as a Minorca, Leghorn, or Andalusian when placed under similar favourable circumstances. But from careful observation during numerous experiments that we have tried with sisters of the same age, we feel convinced that any bird can by high feeding be made to produce for two winters a good third more eggs than would be the case if this stimulating feeding were not resorted to. As before remarked, we have in a previous section gone into this matter more fully, pointing out the necessity of clearing off the hens at the end of their second winter's laying (if not sooner), and the reasons for this being absolutely necessary; so that it is hardly worth while to go over the same ground again. Suffices to say, that in course of time the bird's system becomes thoroughly exhausted under such treatment, and she will not, in most cases, pay for her keep for a longer period of time.

THE FORCING OF THE BREEDING STOCK.

The greatest folly that any poultry breeder is capable of is to feed his breeding stock on stimulating foods in order to produce a greater quantity of eggs. We would guarantee to rear double the number of chickens from a stock of fowls that had been properly fed, without any stimulants being used, than anyone could do from double the amount of eggs obtained from a different stock that had been forced by high feeding to lay an abundance of eggs. Taking this as a fact—and we can assure the reader that such is the case—it must be apparent to all that what they may at the time of getting the eggs look upon as a gain is in reality an absolute loss to themselves. Of what use is it putting down under a hen, or in an incubator, a number of unfertile eggs? or worse still, hatching a number of delicate chickens that are continually dying from liver disease, or some other complaint, and leaving the germs of the said disease for the few remaining healthy ones to pick up and get into as bad a plight as those that have gone before? Without a doubt it is, as we stated at the commencement of this paragraph, the greatest folly that any poultry breeder can possibly show when he wishes to rear strong, healthy, and useful chickens, to go and over stimulate the stock fowls. We have no objections to the slight use of such stimulants under exceptional circumstances, but what we wish particularly to impress upon the minds of our readers is that the continued use of such things, or even making a rule to stimulate at fixed times, is most injurious to the prospects of the chickens in the coming rearing season. As an instance of when such foods might be given with advantage to the stock, we will suppose that the weather has been comparatively mild, the birds have been laying well and looking in the pink of health and condition. On a sudden a violent snowstorm comes on, accompanied by a bitter and piercing cold wind, which cuts up the birds terribly; so much so that instead of looking bright and sprightly, they are all hunched up in the house or run with their feathers ruffled, looking the picture of misery. Now take a teaspoonful of one of the powders before mentioned to every two birds, and mix it in their soft food with hot water; give them also warm water to drink, and some meat at about ten o'clock. What a difference is then observable! The birds, instead of looking more dead than alive, are all on the move, with their feathers smooth and sleek, and if the bad weather holds out for any length of time, and we each day make the teaspoonful of powder do for one more bird until it is only given to every five hens, not only will no harm be done, but it will be found that (provided the other things that we have recommended are also continued) the birds will commence to lay again, notwithstanding the inclemency of the weather, and if we judiciously break off our high feeding they will still continue, even after we have dropped giving it to them. There is, however, a very peculiar circumstance that we have noticed in regard to the change of the weather. If it is mild, and cold suddenly sets in, the birds often stop laying, and also, if the weather is cold and the birds are laying, they continually stop when it turns mild. We can only put it down that a sudden change of temperature—no matter in what direction—is decidedly against the chances of a well filled egg basket. Consequently, it therefore behoves us to be careful in our feeding, even after the bad weather has given over to a more congenial atmosphere, and it will be advisable to continue the stimulants for another week, lessening the quantity each day. From the foregoing it will be seen that the only times that we would permit of stimulants being given to the breeding stock is when the birds are out of sorts, not for the purpose really of promoting egg production, but simply to keep them in good health, just in the same way as some people never take stimulants excepting when they are unwell, and that although we recommend that these shall be gradually discontinued after the evil has passed, it is simply to guard against a check to the fowl's system by another sudden change.

Overcrowding of the House and Run.

Few things are more hurtful to the keeping of the stock in good condition than the overcrowding of the fowl house, or space that birds in confinement are permitted to enjoy. (That they always enjoy the miserable small wet, muddy and unwholesome runs in which they are sometimes found is very doubtful.) We have at commencement of this section pointed out the shape of house that we consider most desirable, and the means to be employed in order to determine the number of birds that any house manufactured after this style is capable of holding. But under this heading we desire to supplement what we then said by a few remarks, as it has occurred to us that the same may not be quite clear to some. It can readily be understood that a large Langshan or Plymouth Rock hen will require more perch room than a small but neat Hamburg. However, if one more such fowl as a Hamburgh be added to the amount that we have given, and one Langshan or Rock be subtracted from the same, about the correct number will be arrived at, and in any case a few visits to the fowl house at night time will soon determine whether the birds have or have not sufficient perch room, and the evil, if any, can then be rectified. But although the overcrowding of the fowl house is bad, more especially if sufficient ventilation to carry off all the foul gas is not provided, yet it cannot, to our mind, be compared to the evil results that arise by keeping too many fowls in any given run or plot of ground. We consider that no *fixed* amount of space that a certain number of birds can occupy, with all likelihood of health, can possibly be given. So much depends—at least, such is our experience—on the nature of such run or plot. Whether it be a covered run or an open one; whether it be of a dry or wet nature; whether the plot of ground is bare of grass, or covered with a goodly supply of same; whether the soil is of a clayey nature, or one that the rain can easily permeate through; and, in fact, a number of "ifs" and "ands," too numerous to mention. Further, so much depends, also, upon the attendant, and the amount of time that he or she has at their disposal, to look after the wants of the birds, and the cleanliness of their house and run. There are many that we know who could keep double the quantity of fowls in a given spot in perfect health, whereas another would be pestered with disease from beginning to the end of his career as a poultry keeper. Without having a full knowledge of the circumstances of any individual case, we would, on these grounds alone, decline to give any fixed number of birds to a given quantity of ground. It will, of course, be understood that we are speaking more particularly now of birds in confinement; the question of birds running wild we have previously dealt with. Reluctantly we must therefore leave the subject of overcrowding of the run more or less to the judgment of each individual, merely remarking that the same should always be kept sweet and clean, the earth in the covered run never allowed to get wet, or the grass in the plot to become sour. It is infinitely better, and far more profitable, to keep a small quantity of fowls in thorough health and condition, than a large number of unhealthy, unsightly, and unremunerative ones.

The Question of Grit.

Animals are all provided with teeth, in order that they may properly masticate their food before passing it into the abdomen. But the bird kingdom is differently constituted, soft billed birds—that is those that live on worms and such like food that can easily be digested—requiring no substitute for the teeth in animals whatsoever. Yet in the case of others that feed considerably on harder foods, such as wheat, barley, etc., it is absolutely necessary to a proper digestion of these foods that the birds should provide themselves with some means of mastication other than what Nature has furnished them with. When a fowl picks up its corn it passes not into the stomach of the bird, but simply into a receptacle, which is nothing more or less than a convenient bag, in which the fowl can hurriedly deposit its food until it has sufficient time to comfortably consume it. From this bag, commonly called the "crop"—the food is passed at leisure into the gizzard, and it is here that the actual mastication of it takes place. But although the gizzard is exceedingly strong and tough, it is unable entirely of its own accord to adequately perform this duty, but requires the assistance of some hard materials, such as stones, crockery ware, and the like, so that by its action it is enabled with these additions to grind the food up into such a state that it may nourish the bird's system. Although we have previously spoken of this matter in a former section, this is, to our mind, such an important subject, that a repetition somewhat, of what we then said, will not be out of place. How many times have we heard farmers' wives remark that birds always do well on fresh ground for a few years, but that after a certain lapse of time they can never be kept so profitably? In many cases this is undoubtedly owing to the very great ignorance which is proverbially displayed by our home agriculturists of the nature, management, and diseases of poultry, so much so, that diptheritic roup, or some equally contagious disease, is permitted to run its entire course, to more or less decimate the yard, and to leave the bacilli of the disease for fresh arrivals to quickly pick up. But in many other instances it is entirely owing to the want of good sound grit. Not once, but repeatedly have we seen flocks of fowls in farmyards that "never seem to do very well," improve most rapidly after a hundredweight or two of good sharp flint grit has been given them, and their owners have simply been astonished at the results. Several times have we had the following remark made to us, when such advice has been given and acted on, "If I hadn't seen the results with my own eyes, I should never have believed it possible that the giving of pieces of stone would have made all this difference to the health and condition of my fowls." Yet so it is, and we can but strongly advise poultry keepers to always have a plentiful supply on hand for the birds to help themselves. Shallow boxes to hold the same, is perhaps the best means of preventing waste, and these should be placed in certain places about the farm, or in the runs. A few shillings spent annually in this way will make pounds, difference in the returns.

Parasites in Fowls.

Unfortunately, as all poultry keepers know, fowls are subject to insects, and most troublesome things they are if ample precautions are not taken to keep them under. There is no disease to our mind half so dangerous, as to find one's fowls covered with insects. Roup and the like are, of course, the actual cause of far more deaths than can ever be laid to the account of insects. But our aim has ever been not so much to find out a cure for a certain disease as to endeavour by careful observations to get at the *root* of the evil. Let the reader not suppose that we are endeavouring to pose as some scientific professor on the diseases, or cause of diseases, in poultry. With regret we must acknowledge that what underestandings we have come to on this subject are simply from practical experience and that we have been aided by little or no scientific knowledge in our researches. Neverthelesss, although the deductions that we make may, to a certain extent, be in error, the broad facts remain, and with this data to work on the poultry keeper is able to combat with misfortunes equally as well as if he knew the why and the wherefore of his actions. As also in the case of chickens, we maintain that insects, and insects alone are the *primary* cause of nine-tenths of the diseases that poultry are liable to. Strange as this theory may appear to some, we cannot get away from our actual experience in the matter, and in fact if anyone will take the trouble to consider the subject carefully there is really not much to be surprised at. A fowl that is covered with vermin has much annoyance to put up with; continually is it pecking itself or endeavouring to get rid of its tormentors by smothering itself in dust, instead of being actively engaged in seeking for worms and other delicacies that would go to fortify its system. At night, too, its rest is repeatedly broken by the worry and inconvenience that these pests cause, and instead of flying down from the roost with the other birds, feeling refreshed by its night's rest, it is inclined to remain on the perch several hours later, and rarely makes its appearance until the breakfast is being greedily consumed by the others that have had their appetites sharpened. But infinitely more injurious than all these is the direct action of the insects on the fowl's body, the worst offenders being the ticks. They suck the very life blood from the bird; so much so, that its constitution is thoroughly weakened, and with its system already out of order by the other inconveniences it has been compelled to put up with, who can be surprised if at the first opportunity that occurs, some contagious disease is readily imparted to it, and the bird succumbs, its illness and death being accredited to the said disease, but the real or primary cause being, in reality, nothing but insects. On no account, then, let a good and useful dust bath be omitted from the fittings of your poultry run, or some convenient shelter. This is best made by digging out a hole about eighteen inches deep and three feet square. Into this hole place a box about three feet square, with its edges high enough so that they protrude above the ordinary ground some two or three inches. Fill up the same with dry sand, in which a plentiful supply of flour of sulphur and insect powder has been mixed. Into this the fowls will occasionally resort, and by dusting themselves well with this concoction, free their bodies largely from the insects. Besides this precaution being taken, we prefer, once a year—just before the birds commence their moult—to catch each one, and by dipping the fingers into a solution of one-third paraffin oil and two-thirds water (which is best mixed by boiling the same), sprinkle the feathers well on the underneath side, especially down each side of the breast, the fluff on the abdomen, and the vent. This will effectually get rid of all kinds of insects and give the birds a good chance to keep themselves free, by the use of the dust bath, for another twelve months.

THE MOULTING SEASON.

With ordinary farmyard stock, or hardy crossbred birds, that have entire liberty, but little attention need be paid to the matter of successfully moulting birds, more especially if they have been well attended to, and their sleeping accommodation kept in a perfect state of cleanliness. But with highly bred specimens, or birds that are kept in confined runs, several precautions are often necessary for the poultry keeper to observe, if he desires to see his fowls quickly and conveniently through the moult before the cold weather sets in. Here again, do these ever pestering, inconvenient, and annoying insects play an important and detrimental part. A fowl that is covered with these pests rarely, if ever, moults in good time. Pick up any bird that has "hung in the moult," and in ninety nine cases of every hundred we venture to assert that the fowl has a very great number of insects on its body. Hence our strong reason for recommending in the preceding paragraph that the birds should be carefully gone over with paraffin and water just previous to the moult, and that the tail should receive special attention, as this part of the fowl's anatomy is usually the chief drawback to a thorough and complete moult. Besides doing this, a teaspoonful, to every three birds, of flour of sulphur should be mixed in the morning's meal three times a week, on bright, warm days, and on the alternate days a little saccharated carbonate of iron (as much as will lie on a sixpence) should be given to each bird in the same way. But we do not advise the latter in the case of white plumage varieties, as its action is to bring out the colour, and if a white is inclined to go yellow, the iron will considerably facilitate matters. Further precautions are sometimes necessary, especially when, as is not infrequently the case, the owner desires to get a bird "through" in time for some early show. Change of temperature has a wonderful effect in hastening the moult. Bring a fowl into a warm and heated place—for instance, an enclosed shed with a corrugated iron roof, on which the sun has full play—and leaving her there for a month, she will in all probability start moulting at the expiration of that time, if our previous advice as to feeding is acted on, but should she not, turn her out into the run again, and in nearly every instance will she start moulting almost immediately. It will of course be understood that we are referring naturally to the time of year when moulting is general, or anyhow has commenced, with some of the birds. Most handy places to moult out cock birds are boxes constructed about 5 ft. 6 in. in height 5 ft. long and 3 ft. 6 in. broad, boarded all round, with the exception of a narrow strip, running the whole length of the "cock box," about 6 inches wide, which should nearly be covered with wire netting. In these the bird's plumage is prevented from getting tanned by the sun, and the colour is brought out to a greater degree. During the moulting process the strain on the bird's system is considerable, and a little meat should be daily given. A teaspoonful of codliver oil daily will also be of great assistance in fortifying the fowl's constitution. At least a third of finely ground oats (not crushed oats, which are most injurious) should always be given during the moult, if not employed, as we strongly recommend they should be employed, as a general rule, both for stock birds and chickens.

SEPARATION OF THE STOCK COCKS.

Many poultry keepers make a very great mistake in allowing their stock cocks to run with the hens all the year round. We cannot too strongly impress upon the reader the great benefit that arises from keeping the cock apart from his hens as soon as the breeding season is over—another use to which the "cock boxes" above mentioned may be put to. What is the reason for a second season's cock being unable to fertilise the eggs? No doubt at times it is owing to the fowl having been unwell and has not recovered itself sufficiently, but in far more cases it is owing to its system being thoroughly played out. Let him have some four or five months' quiet by himself, in order that he may recoup his strength, and, provided he is not handicapped by some illness, few cockerels will show a greater percentage of fertile eggs than are collected from the pen of the old bird.

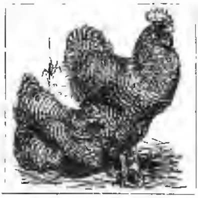
SIGNS OF INACTIVITY OF STOCK BIRDS.

If the male bird, instead of calling his hens around him when food is thrown to them, drives them away, and tries to eat as much as he can himself, it may be taken as an almost certain fact that the eggs from his pen or yard will not prove to contain chickens after incubation. Another sign of unfertile eggs is when the hens do not follow him, or collect around him, but instead keep out of his way as much as possible. In either case, if a season's hatching and rearing operations are not desired to be thrown away, the bird should at once be removed and a fresh one supplied. Immediately (provided the new cock is thoroughly healthy) will the hens surround him, which will be confirmation of the uselessness of the other. The converse of these signs is self evident. If the cock is continually calling his hens, or if the latter are always found in his immediate vicinity, no apprehension need be felt as to a good percentage of the eggs proving fertile

SUMMARY.

To keep poultry successfully, it is above all things necessary that the house, and the ground that they run over, are kept sweet and clean; that no accumulation of dirt is allowed to collect in the former; that ample ventilation to carry off foul gases is provided; and that the latter, if it be merely a small covered run, shall have the soil removed (not dug over time after time, which is poor policy), and replaced with fresh; or, in the case of the fowls having a grass run, that this should be given a rest, if possible, for at least two or three months in the year. That in the case of fowls that have their liberty, nothing is more conducive to their health, to the number of eggs that they will lay, or to the strength and sound constitution of the chickens that they may produce, as a shifting of the fowl house every year on to fresh ground and pastures new. That most important question of foods should receive the utmost attention, and all inferior grains be discarded, and nothing but what is perfectly sweet and wholesome should be permitted to be given to the poultry. To do otherwise is simply to court disaster, so far at least as any profits are concerned. Feed well and judiciously, and if fowls will not pay you under such circumstances, they most assuredly will not if you either neglect them or supply them with more or less rubbish as their food. The purifying effect that green food has on poultry is a matter which requires your most careful consideration, and on no account should a plentiful supply of—what we might term—this most excellent tonic be omitted from the bill of fare of every poultry keeper. Without grit your bird's digestion will soon be at fault, and in consequence be far more liable to pick up any disease that may be prevalent in the neighbourhood. Without a dust bath, and more actual personal supervision, your birds are subject to become afflicted with insects, the curse, to our mind, of the poultry yard. Without special care being given as to the quantity of food supplied to your fowls, soft shelled eggs, inactivity and uselessness will result, and the corn bill's proportions be swelled enormously. Without regular days for cleaning out the fowls' abode, often will this necessary item be neglected, and considerable loss and inconvenience arise therefore, and without a correct account being kept of the workings of your poultry operations, both on the debit and credit side, you will never know rightly whether you are making money or losing it, whether one branch of your operations is paying or another swallowing up all the profits made by your labours; and, therefore; you will be unable to rectify your error in time to make the whole business a success. Lastly, we would impress upon the owner to take a lively interest in his stock—not to leave it entirely under the care of some lad or old man, which latter is, perhaps, considered "only fit to look after the poultry." Such procedure will never pay. Unless they can be placed under the charge of a competent and experienced person, nothing will make poultry keeping a success but the personal supervision, and this, too, an *interested* supervision, of the owner.

The management of the sitting hen will be found in the following section, No. V., on Incubation, both natural and artificial.



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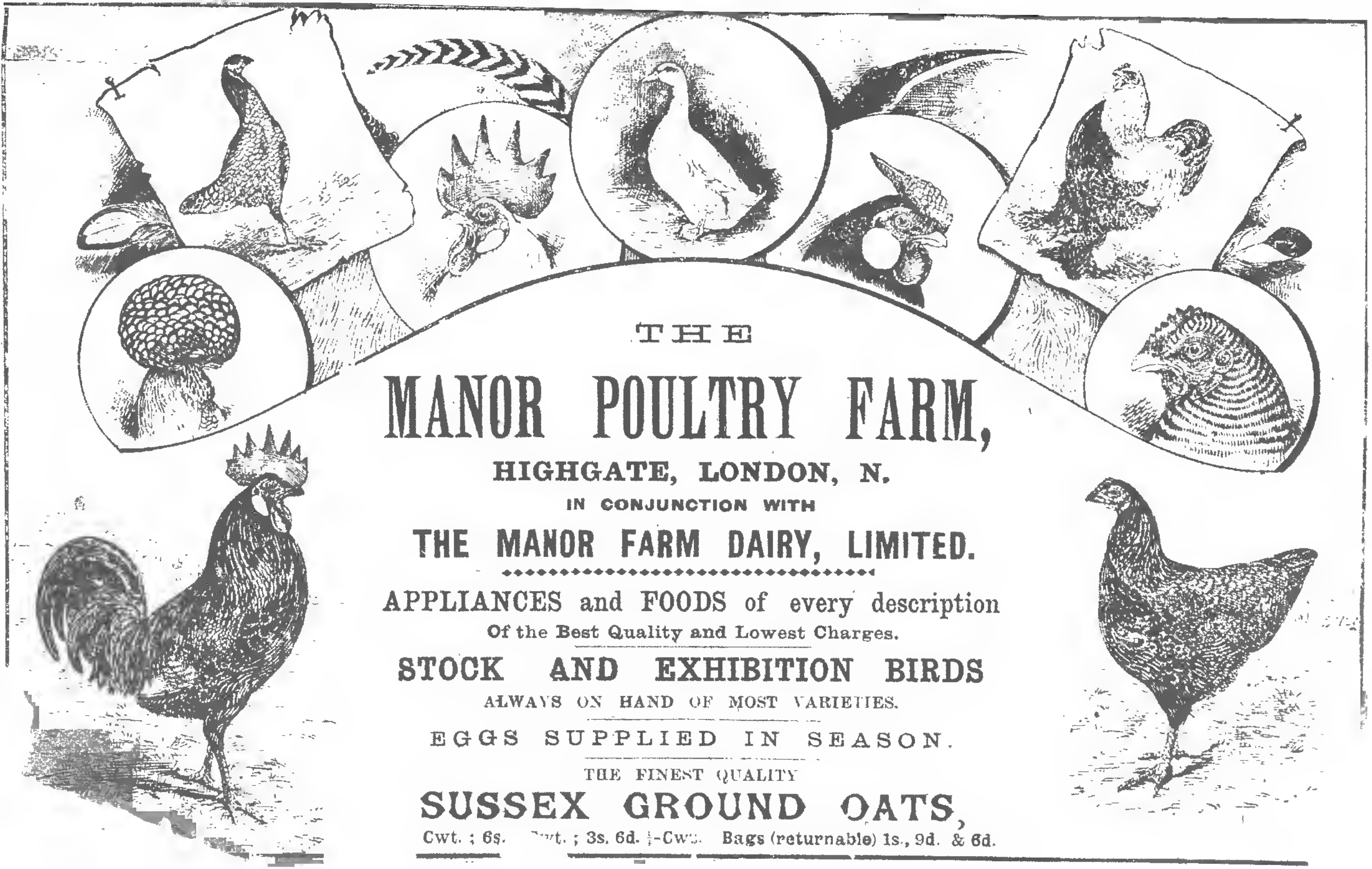

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